ERS Staff Paper

Economic
Research
Service

Commercial
Agriculture
Division

Number 9509

Comparative Social Measures of Subsidies to Agricultural Production

Martin Johnson

Comparative Social Measures of Subsidies to Agricultural Production. By Martin Johnson. Commercial Agriculture Division, Economic Research Service, U.S. Department of Agriculture. Staff Paper No. AGES-9509.

Abstract

Agricultural subsidies in developed countries are usually viewed as economic benefits for the farmer, and thus, are considered to be "farmer-based." But agricultural subsidies can be viewed from another perspective--as economic costs to the citizens of the countries, and thus, could also be considered as "society-based." This report presents a method for measuring the cost to citizens of supporting agriculture in developed countries. The report analyzes the cost in total, per capita, and as a share of the national economy for 10 countries and the European Union from 1979 to 1991.

Keywords: subsidy, PSE, agricultural policy

Contents

1301 New York Avenue, NW
Washington, DC 20005-4788

April 1995

Comparative Social Measures of Subsidies to Agricultural Production

Martin Johnson

Introduction

Agricultural subsidies in developed countries are usually viewed as economic benefits for the farmer, and thus, are considered to be "farmer-based." But agricultural subsidies can be viewed from another perspective--as economic costs to the citizens of the countries, and thus, could also be considered as "society-based." This report presents a method for measuring the cost to citizens of supporting agriculture in developed countries. The report analyzes the cost in total, per capita, and as a share of the national economy for 10 countries and the European Union from 1979 to 1991.

The costs per capita and as a share of the national economy are of particular interest. These costs can be compared across countries and are approximate measures of what each citizen pays to support agriculture. The countries in this study are all members of the Organization for Economic Cooperation and Development (OECD). Ten of them--Australia, Austria, Canada, Finland, Japan, New Zealand, Norway, Sweden, Switzerland, and the United States--are considered separately. The members of the former European Community, pursuing its Common Agricultural Policy, are taken as a whole as the European Union (EU).

The analysis shows that the countries differed in how much citizens paid per person and as a percentage of gross domestic product (GDP) for agricultural support. The countries could be divided into three groups by the amounts of expenditures. The high-spending group--Norway, Finland, and Switzerland--spent between US$700 and US$1,300 per capita per year and between 2.5 and 5 percent of GDP per year. The middle-spending group--Japan, Canada, Austria, Sweden, and the EU--spent between US$200 and US$550 per person per year and between 1 and 2.4 percent of GDP. The low-spending group--Australia, New Zealand, and the United States--spent between US$50 and US$200 per capita per year and between 0.5 and 1 percent of GDP.

Across countries, these costs per person and as a percentage of GDP meant that, from 1979 to 1991, the annual total cost of agricultural support in all the countries was in the billions of dollars. These costs peaked in 1986 and have generally declined since then.

How the Costs Of Supporting Agriculture Are Measured

The methodology used in this report involves PSE's, or producer subsidy equivalents, developed to measure how much income is transferred to farmers through agricultural programs.

Border protection of agricultural production and agricultural subsidies were contested in the recently concluded Uruguay Round negotiations of the General Agreement on Tariffs and Trade (GATT). The United States and other countries sought to restructure farm policies so that programs that support farm income but also distort trade and production decisions would be reduced over time. The effect of policies of the various countries on agricultural production and trade was not easy to compare, however, because each country supported farm income in different ways. In response, total income transfers were developed to measure how much income farmers received through agricultural programs. Then, to compare total income transfers across countries, PSE's were introduced.

Traditional PSE's are derived by dividing total transfers to producers by a physical or monetary measure of the level of production. As such, PSE's answer specific questions: How much money per ton do wheat farmers in the United States, the EU, or Argentina receive through agricultural policies? What share of farm income in Australia, New Zealand, or Sweden results from government intervention? The answers to these questions allow a cross-country comparison of commodity support to farmers. The perspective seen in such analysis, as determined by the divisor, is farmer-based: that is, it is based on the benefit received by farmers compared with their output.

But this report views agricultural policy from the society-based perspective. Agricultural policies are results of the political process, the complex interplay of politicians and the people they represent. The reasons for these continuing agricultural supports, and the popular validation that sustains them, is not at issue here. Rather, the issue is to describe and compare what citizens of the various countries pay for their policies of agricultural support. Just as farmer-based PSE's can be compared across countries, society-based PSE's can also be compared across countries. Although total expenditures per nation will be briefly described, this report addresses itself mainly to two questions, both of which concern society-based PSE's. First, how much do countries pay per capita for agricultural policies? And, second, how much do countries pay for their agricultural program as a percentage of gross domestic product (GDP)?

Society-based PSE's are calculated like traditional farmer-based PSE's. The support of agricultural policies that directly or indirectly provide farm incomes is summed to obtain total transfers to producers. But, next, instead of dividing total transfers to producers by farmer-based values (farm income or total production), the new measures are obtained by dividing total transfers by society-based values, which, in this report, are, first, the country's total population and, second, its gross domestic product. By dividing in this way, the society-based PSE's can be compared across countries in much the same way that traditional PSE's can be compared among nations.

Data for this report come exclusively from OECD calculations of income transfers to farmers and PSE's. OECD calculates these for its member countries. Although USDA's Economic Research Service also calculates PSE's for the United States and for some of these countries, as well as others, its figures are not used here, since the resulting numbers, while similar, are not identical with those of OECD.

Total Policy Transfers to Producers

We will first consider total transfers to producers before we compare these totals against the country's population or the national GDP. Total policy transfers to producers are large but have fluctuated since 1979. OECD has calculated total policy transfers to producers for 15 agricultural products from 1979 to 1991 for the 10 countries previously listed and the EU.[1] These countries are all wealthy nations of which the agricultural sectors are small relative to their respective economies. The total transfers recorded by OECD do not include transfers from all agricultural policies, however, since many countries support more than these 15 agricultural products.

The general rule in calculating the direct or indirect transfer income to producers from a given policy is to answer the question: How much does this policy increase or decrease farmers' net revenue (total revenue minus costs) compared with the situation where no policy exists? Total transfers to producers are obtained by summing across all policies. Transfers to producers are sometimes an explicit item in the government's budget, but sometimes they are not. Consequently, a country's spending on agricultural policies can exceed specific costs labeled as such. In this report, the use of the word "spending" is meant in this larger sense. OECD classifies policies into six groups: market price support, direct payments, reduction of input costs, general services, subnational policies, and other.

---

[1]Wheat, barley, oats, sorghum, rice, soybeans, rapeseed, sunflowers, sugar, milk, beef and veal, pork, mutton, wool, and eggs.

Policies in the first three groups generate the largest income transfers. For example, market price support policies include producer price guarantees, tariffs, import licensing, and import quotas. Direct payment policies include U.S. grain deficiency payments and the EU's co-responsibility levy system. Policies that reduce input costs include below-market lending rates, lower fuel excise taxes, special capital depreciation tax schedules, and subsidies on fertilizer. General services include animal and plant inspection services and public agricultural research.

Transfers to producers across time are compared by adjusting the nominal transfers to producers for each country by each country's inflation index to obtain real transfers to producers in 1991 currency. This is done for each of the 11 countries (the 10 previously listed above, plus the EU). Real transfers to producers are converted to U.S. dollars using each country's 1991 U.S. dollar exchange rate in order to compare spending across countries.

The countries with the largest real transfers to producers are the United States, the EU, and Japan (fig. 1, panel a). Each of these nations transferred more than US$30 billion annually to its producers between 1989 and 1991. Real transfers to producers in the United States and Japan declined from 1979 to 1991, although the downward trend is statistically significant only for Japan and not for the United States. In the EU, real transfers to producers rose considerably in 1986 because of EC enlargement (Spain and Portugal joined the EC) and low world commodity prices. Afterwards, real transfers settled at a higher level than before 1986, but no statistically significant upward trend for the EU can now be detected.

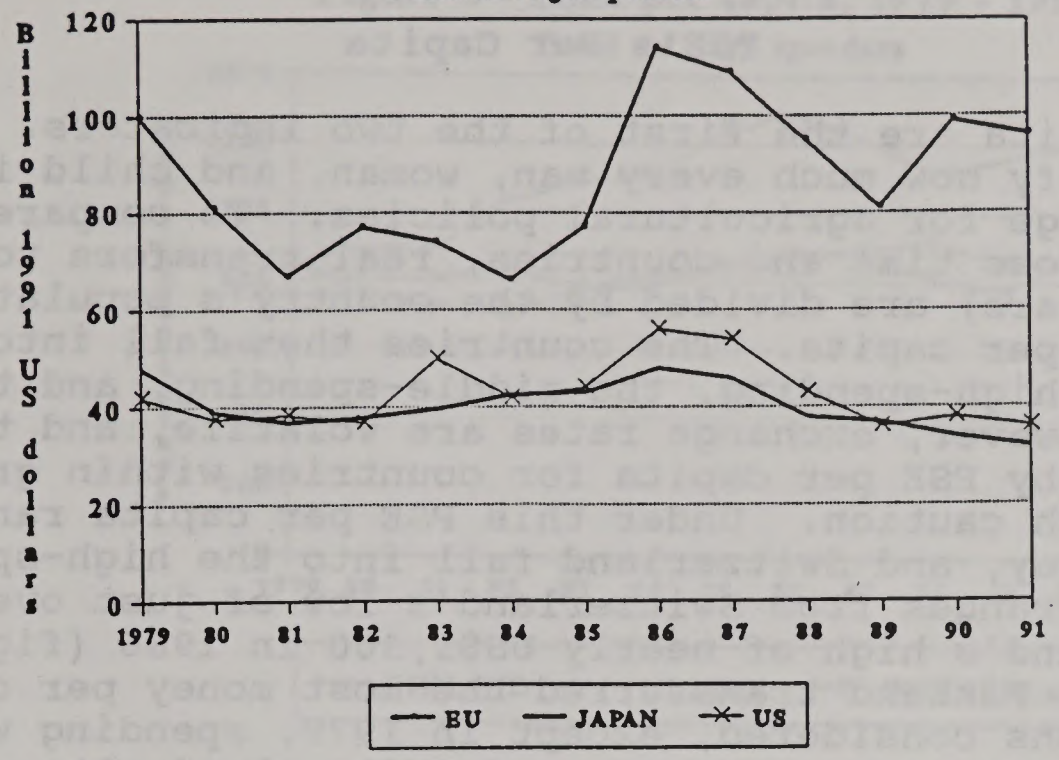
Canada, Finland, Switzerland, Norway, and Sweden transferred less than US$11 billion but more than US$3 billion per year to their producers from 1979 to 1991 (fig. 1, panel b). All showed a slightly increasing trend in real transfers to producers from 1979 to 1991, but only Finland's trend was statistically significant.

In every year, Austria, Australia, and New Zealand transferred less income to their producers than did the other eight nations (fig. 1, panel c). Transfers never exceeded US$3.5 billion, and except for New Zealand's drastic decline after 1986, transfers to producers were always more than US$1 billion. Australia remained relatively stable over the time period, showing no significant trend either to increase or to decrease transfers to producers. Austria, on the other hand, significantly increased transfers to producers.

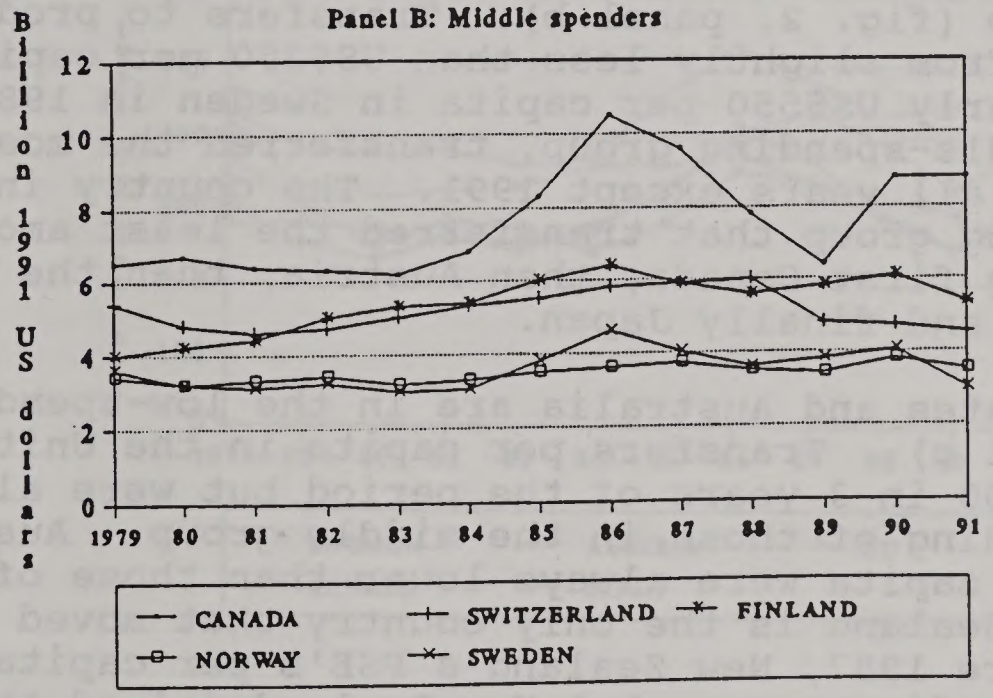
In short, the 11 countries transferred billions of U.S. dollars to their producers every year through agricultural policies. While transfers to producers generally peaked in 1986 and declined after 1986, only New Zealand drastically reduced transfers to producers.

Figure 1 - Total transfers to producers, 1997 - 1991

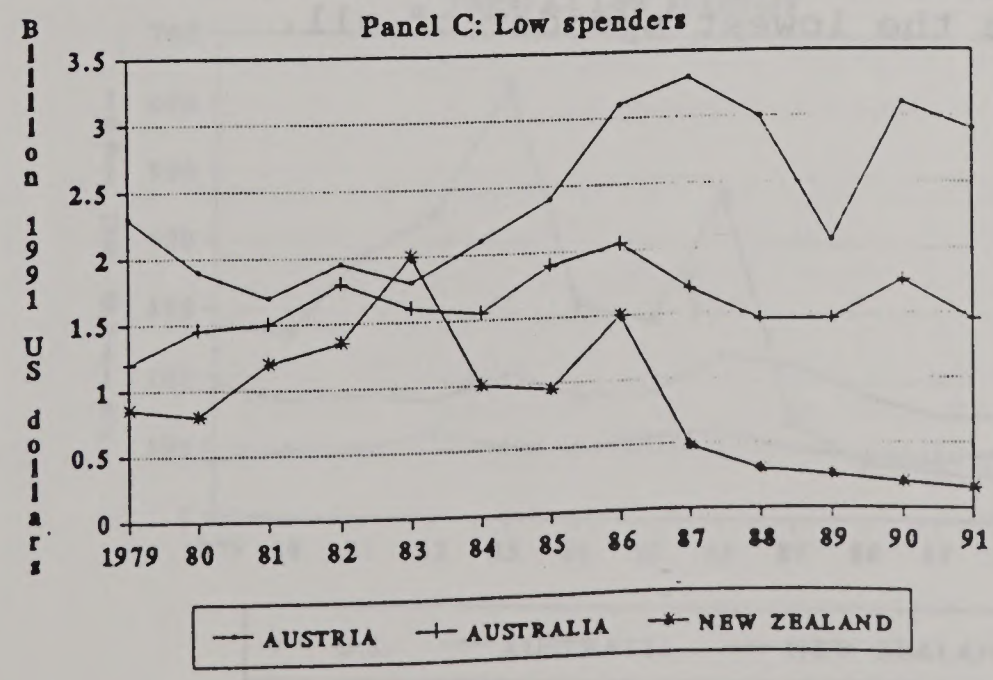
Panel A: High spenders



Panel B: Middle spenders



Panel C: Low spenders



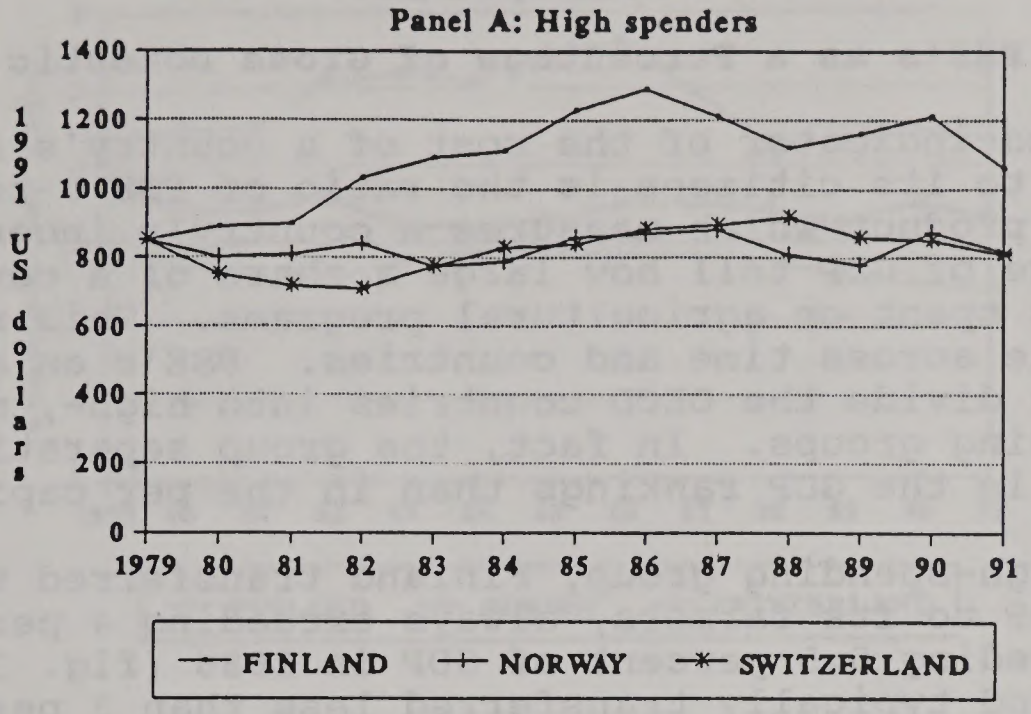
PSE's Per Capita

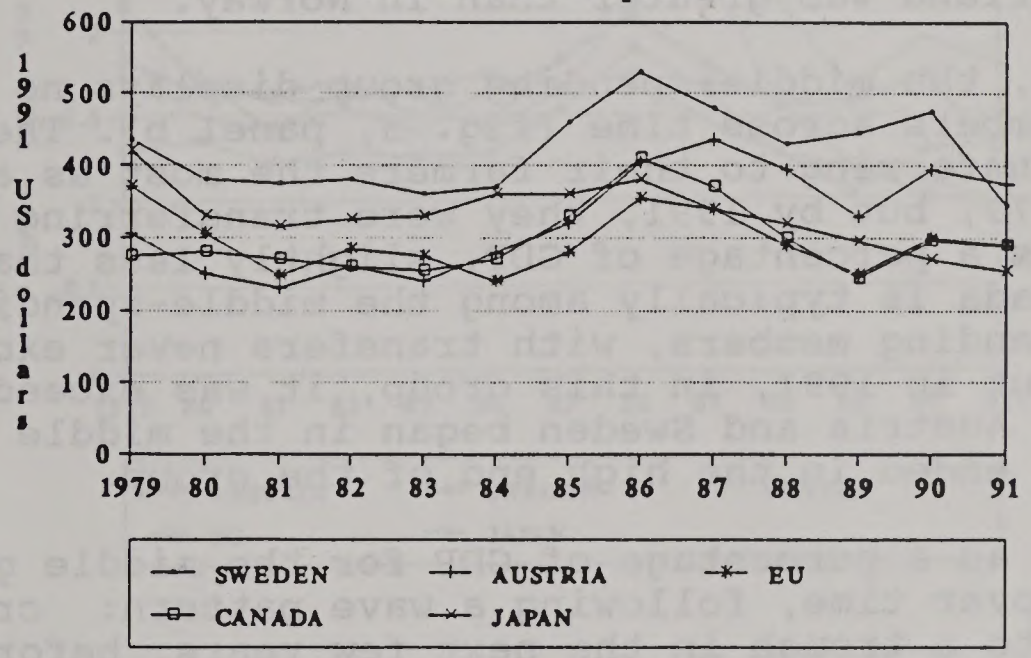
PSE's per capita are the first of the two indicators. PSE's per capita identify how much every man, woman, and child in a country pays on average for agricultural policies. To compare among transfers across time and countries, real transfers to producers (in U.S. dollars) are divided by the country's population to obtain PSE's per capita. The countries then fall into three groups: the high-spending, the middle-spending, and the low-spending. However, exchange rates are volatile, and the rankings of countries by PSE per capita for countries within groups must be viewed with caution. Under this PSE per capita ranking, Finland, Norway, and Switzerland fall into the high-spending group, which ranges from Switzerland's low of just over US$700 in 1982 to Finland's high of nearly US$1,300 in 1986 (fig. 2, panel a). In fact, Finland transferred the most money per capita of all the nations considered, except in 1979, spending well over US$1,000 in most years. Norway and Switzerland alternated their relative spending positions over the 12-year period.

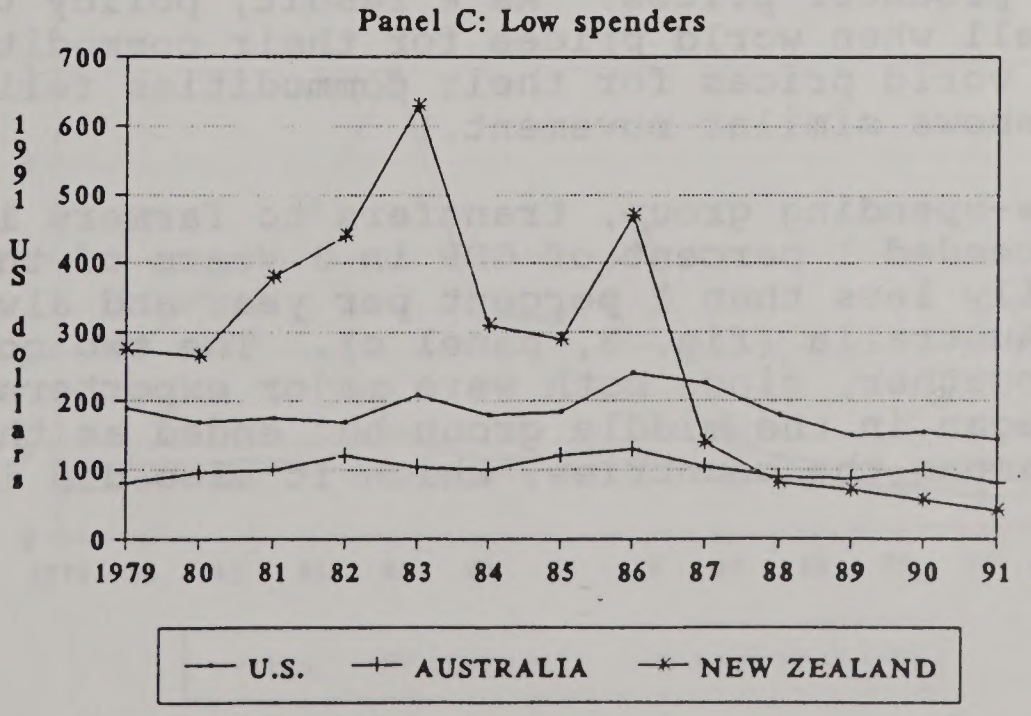
Austria, Canada, the EU, Japan, and Sweden are in the middle-spending group (fig. 2, panel b). Transfers to producers in this group ranged from slightly less than US$250 per capita in Austria in 1981 to nearly US$550 per capita in Sweden in 1986. Sweden, among the middle-spending group, transferred the most to producers for all years except 1991. The country in the middle-spending group that transferred the least amount of funds varied: being first Canada, then Austria, then the EU, then Canada again, and finally Japan.

The United States and Australia are in the low-spending group (fig. 2, panel c). Transfers per capita in the United States exceeded US$200 in 3 years of the period but were always less than the spending of those in the middle group. Australia's transfers per capita were always lower than those of the United States. New Zealand is the only country that moved between groups. Before 1987, New Zealand's PSE's per capita belonged in the middle-spending group, but New Zealand joined the low-spending group in 1987 following drastic changes in that country's agricultural policies. In fact, after 1987, New Zealand became the lowest spender of all.

Figure 2 - PSEs per capita, 1979 - 1991







PSE's as a Percentage of Gross Domestic Product

The second indicator of the cost of a country's agricultural policies to its citizens is the ratio of PSE's to the gross domestic product which measures a country's income. PSE's as a percentage of GDP tell how large a share of a country's total income is spent on agricultural programs. This measure is easily comparable across time and countries. PSE's as a share of the GDP again divide the OECD countries into high-, middle-, and low-spending groups. In fact, the group separation is even stronger in the GDP rankings than in the per capita rankings.

In the high-spending group, Finland transferred the largest share of its GDP to its farmers, always exceeding 4 percent of GDP and even exceeding 5.5 percent of GDP in 1986 (fig. 3, panel a). Switzerland typically transferred less than 3 percent of GDP, while Norway always transferred more than 3 but less than 4 percent of GDP. Unlike the pattern of PSE's per capita, these two nations no longer alternate positions, because GDP per capita in Switzerland was greater than in Norway.

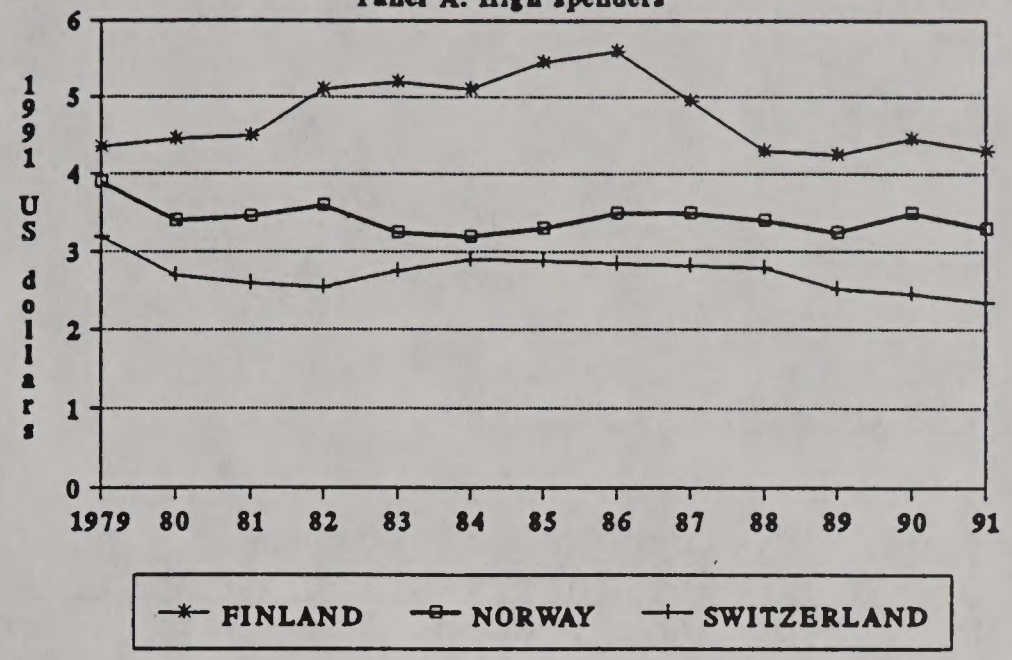
As before, the middle-spending group displays no steady ranking of its members across time (fig. 3, panel b). The EU and Japan began transferring to their farmers the most as a percentage of GDP in 1979, but by 1991, they were transferring the least to farmers as a percentage of GDP, slightly less than 1 percent of GDP. Canada is typically among the middle-spending group's lowest spending members, with transfers never exceeding 2 percent of GDP, but in 1991, in this group, it was exceeded by only Austria. Austria and Sweden began in the middle of this middle group but ended in the high end of the group.

The PSE's as a percentage of GDP for the middle group move together over time, following a wave pattern: cresting in 1979, dropping to a trough in the next few years, before cresting again in 1986 and falling in subsequent years (fig. 3, panel b). These society-based PSE's move together because the involved countries produce similar commodities and support their production largely by fixing producer prices. As a result, policy transfers to farmers fell when world prices for their commodities grew, and grew when world prices for their commodities fell. (Fig. 2, panel b, shows similar movement.)

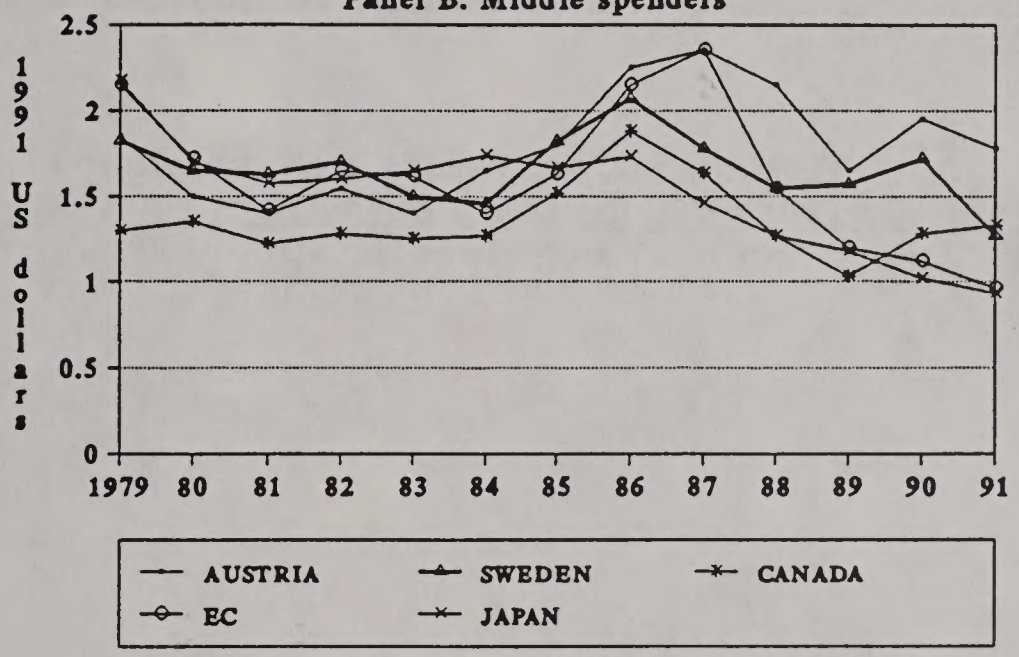
In the low-spending group, transfers to farmers in the United States exceeded 1 percent of GDP in 3 years of the period, but were usually less than 1 percent per year and always more than those of Australia (fig. 3, panel c). The two countries tended to move together, since both were major exporters of grains. New Zealand began in the middle group but ended as the lowest spending among the countries, which it also did in spending per capita.

Figure 3 - PSE as a percent of GDP, 1979 - 1991

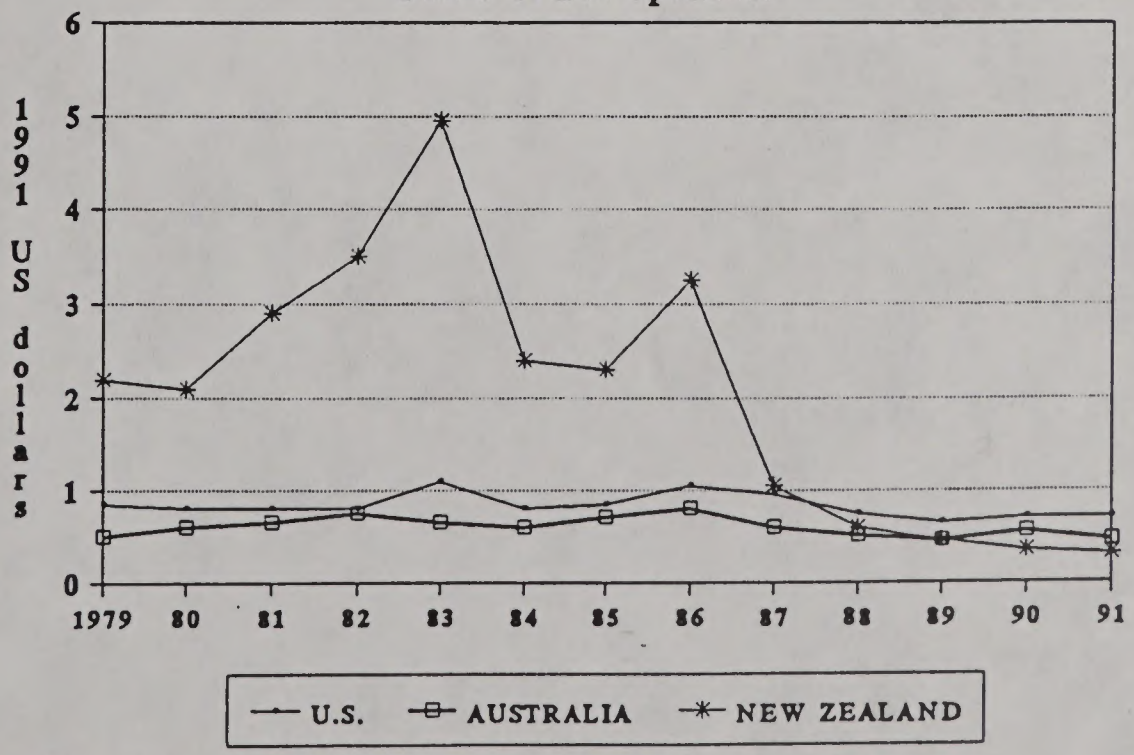
Panel A: High spenders



Panel B: Middle spenders



Panel C: Low spenders



References

International Monetary Fund. International Financial Statistics. Washington, D.C., various issues.

Mabbs-Zeno, Carl C., and Arthur Dommen. Subsidy Equivalents: Yardstick of Government Intervention in Agriculture for the GATT. AIB-558. U.S. Dept. Agr., Econ. Res. Serv. Jan. 1989.

Organization for Economic Cooperation and Development. Tables of Producer Subsidy Equivalents and Consumer Subsidy Equivalents. Paris. May 1992.

Webb, Alan J., Michael Lopez, and Renata Penn. Estimates of Producer and Consumer Subsidy Equivalents, 1982-87. SB-803. U.S. Dept. Agr., Econ. Res. Serv. Apr. 1990.